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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/715,041	11/20/2000	Sang-Jun Choi	SEC.741	6853

7590

01/15/2003

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EXAMINER

THORNTON, YVETTE C

ART UNIT

PAPER NUMBER

1752

DATE MAILED: 01/15/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/715,041

Applicant(s)

CHOI ET AL.

Examiner

Yvette C. Thornton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-7 and 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7 and 9-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This is written in reference to application number 09/715041 filed on November 20, 2000.

Request for Continued Examination (RCE)

1. The request filed on October 24, 2002 for a Request for Continued Examination (RCE) under 37 CFR 1.53(d) based on parent Application No. 09/715041 is acceptable and a RCE has been established. An action on the RCE follows.

Response to Amendment

2. Claims 4 and 8 have been cancelled. Claims 1-3, 5-7 and 9-18 are currently pending.

Claim Objections

3. Claims 3 and 7 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Instant claims 3 and 7 set forth the limitation that R2 is an alicyclic hydrocarbon group; however independent claims 1 and 5 as amended can be nothing else.

Claim Rejections - 35 USC § 102

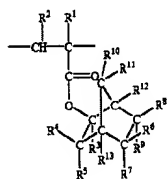
4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

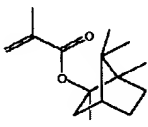
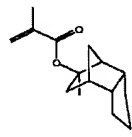
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

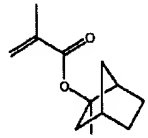
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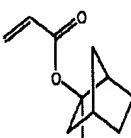
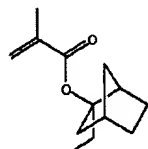
5. Claims 1-3, 5-7, 9-10 and 12-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Kinsho et al. (US 6312867 B1). Kinsho teaches a polymer comprising units of an ester compound having the given general formula (1a) and having a weight average molecular weight of 1,000-500,000 (c. 2, l. 64-67). Formula (1a) has the following structure



. The said polymer may further comprise recurring units of at least one of formulae (2a) to (13a) (see c. 3, l. 20-c. 5, l. 22). Illustrative non-limiting examples of

formula (1a) include  (R2=2-methyl-2-isobornyl; R1=methyl),  (R2-

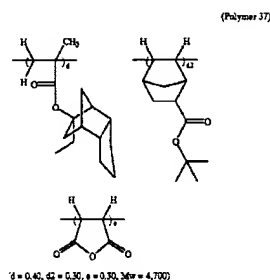
8-methyl-8-tricyclodecanyl; R1=methyl),  (R2=2-methyl-2-norbornyl;

R1=methyl),  (R2=2-methyl-2-norbornyl; R1=H) and  (R2=2-ethyl-2-

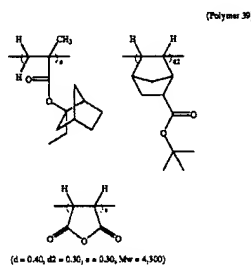
norbornyl; R1=methyl), all which meet the limitations of the first monomer of the instant claims (see c. 7, l. 66-c. 9, l. 35; c. 44, l. 40-c. 47, l. 29). Kinsho further teaches a resist composition comprising the said polymer, a photoacid generator and an organic solvent (c. 21, l. 10-15).

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Kinsho exemplifies the use of polymers 37 and 39 having the following structures:



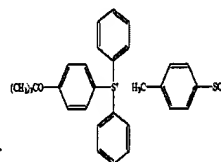
(c. 59, l. 1-20) and



, wherein R1 is methyl and R2 is

8-ethyl-8-tricyclodecanyl and 2-ethyl-2-norbornyl, respectively. The examiner notes the presence of the taught monomer “d2”, which is not claimed by the applicant. The examiner is of the position that the “consisting essentially of” language of the instant claims does not prohibit the presence of this monomer. The “consisting essentially of” language covers the embodiments discussed in the specification. Page 6 of the specification clearly discloses that, “another (meth)acrylate monomer maybe further added to form a terpolymer” (lines 9-10).

Kinsho further exemplifies photoresist compositions (I-37 and I-39) comprising



polymers 37 and 39 admixed with a photoacid generator

(PAG1), which is a

triarylsulfonium salt; tributylamine, which is an organic base; and a solvent PGMEA.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 11, 14-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsho as applied to claims 1-3, 5-7, 9-10 and 12-13 above. Kinsho teaches all the limitations of the instant claims, as discussed above, except it fails to exemplify the use of a the claimed polymer in combination with a photoacid generator selected from the group set forth in instant claim 11; an organic base as set forth in instant claim 14 and a surfactant as set forth in instant claims 14-15 and 17.

Kinsho does however disclose that the preferred photoacid generators include triphenylsulfonium trifluoromethanesulfonate (triflate), triphenylsulfonium p-toluenesulfonate and bis(n-propylsulfinyl) diazomethane (c. 26, l. 8-39; see also PAG2 c. 69, l. 30-40). It would have been obvious to one of ordinary skill in the art to use any of the preferred photoacid generators in combination with a polymer such as those exemplified by polymers 37 and 39.

Kinsho further teaches that especially preferred basic compounds include tertiary amines (triethylamine, tributylamine, tri-isobutylamine and trioctylamine); aniline derivatives and hydroxyl group-bearing nitrogenous compounds (c. 35, l. 26-35). The given examples use tributylamine (TBA), triethanolamine (TEA), trimethoxymethoxyethylamine (TMMEA) and trimethoxyethoxymethoxyethylanine (TMEMEA) (c. 70, l. 56-59). It would have been obvious to one of ordinary skill in the art to use any of the preferred and exemplified organic bases in combination with a polymer such as those exemplified by polymers 37 and 39.

Kinsho also teaches that the resist composition of the taught invention may include as an optional ingredient, a surfactant that is commonly used for improving the coating characteristics. Optional ingredients may be added in conventional amounts so long as this does not compromise the objects of the invention. Nonionic surfactants are preferred, examples of which include perfluoroalkylpolyoxyethylene ethanols, fluorinated alkyl esters and fluorinated organosiloxane compounds (c. 41, l. 45-62). It is the examiner's position that perfluoroalkylpolyoxyethylene ethanol meets the limitation of a polyether as set forth in instant claim 17.

One of ordinary skill in the art would have been motivated by the teachings of Kinsho to develop a photoresist composition comprising the preferred embodiments which includes a polymer such as those exemplified by polymer 37 and 39; a photoacid generator such as that exemplified by PAG2; an organic base such as TEA; a non-ionic surfactant such as perfluoroalkylpolyoxyethylene ethanol; and a solvent to form a photoresist composition which is very low in formation of fine particles (c. 2, l. 8-11) and therefore would improve the yield in the manufacture of integrated circuits (c. 1, l. 51-c. 2, l. 5).

8. Claims 16 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsho as applied to claims 1-3, 5-7, 9-15 and 17 above, and further in view of Hosaka et al. (US 5,405,720 A). Kinsho, as discussed above, teaches all the limitations of the instant claims except the specific amount of surfactant to be used in the taught photoresist composition (instant claim 16) and the use of polyethylene glycol as a suitable surfactant (instant claim 18). Kinsho does however, teach that a surfactant may be added in conventional amounts so long as this does not compromise the objects of the invention and that nonionic surfactants

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are preferred (c. 41, l. 45-62). Hosaka teaches a radiation sensitive composition, which may further contain a surfactant. Hosaka discloses that examples of non-ionic surfactants include polyoxyethylene alkyl ethers, polyethylene glycol dialkyl ethers and polyoxyethylene alkyl phenol ethers (c. 6, l. 61-c. 7, l. 7). The amount of surfactant incorporated into the composition is usually 2% by weight or less based on the solids content of the composition (c. 7, l. 23-28). Hosaka serves to establish that polyethylene glycol dialkyl ether is a well-known and conventional non-ionic surfactant. One of ordinary skill in the art would have been motivated by the teachings of Kinsho to use any well-known non-ionic surfactant in conventional amounts such as those taught in Hosaka in the taught photoresist composition of Kinsho in order to improve the coatability of the taught composition.

Response to Arguments

9. Applicant's arguments with respect to the instant claims have been considered but are of little moment in view of the new ground(s) of rejection.

10. As discussed above, the examiner is of the position that the "consisting essentially of" language of the instant claims does not prohibit the presence of an additional monomer. The "consisting essentially of" language covers the embodiments discussed in the specification. Page 6 of the specification clearly discloses that, "another (meth)acrylate monomer maybe further added to form a terpolymer" (lines 9-10) (see MPEP 2111.03).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- Kinsho et al. (US 6284429 B1) pertaining to an ester compound and polymers, resist compositions and a patterning process using the same.

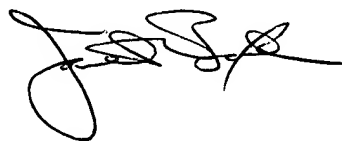
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

14. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1193.

Please note that the examiner has recently changed her name from "Clarke" to "Thornton".

yct *yct*
January 9, 2003



JANET BAXTER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700